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ABSTRACT

An assessment study was conducted to test the effectiveness of the Career Planning Support System (CPSS) materials that were developed to provide systematic program planning for high school career development programs. In 1978-79, eighteen high schools in seven states were evaluated using a pretest-posttest, experimental-control group design. Both experimental and control schools were monitored by telephone calls and site visits in addition to pre- and posttests. A group of experts in fields related to career development and practice completed 21-page rating instruments for each participating high school. A score describing each school on each variable was calculated by forming the average over the three or four raters who rated each school. Data were analyzed using analysis of covariance (ANCOVA). Results showed positive growth of career development activities in the experimental schools as opposed to the controls. It was concluded that the gains were of sufficient magnitude to be nontrivial, and that CPSS addresses an important educational need. (Note: the evaluation focused on the process of career development planning and activities, not on effects on students.) (KC)

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CAREER PLANNING SUPPORT SYSTEM. A REPORT.

U S DEPARTMENT OF HEALTH EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

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PROGRAM AREA: Career Development Program Planning

I. TITLE OF PRODUCT: The Career Planning Support System (CPSS)

II. DEVELOPER: The National Center for Research in Vocational Education

III. FUNDING: National Institute of Education. Testing $340,373

IV. DEVELOPMENT AND TESTING PERIOD: Development: 1971-1976; Testing: 1978-1979

V. BRIEF DESCRIPTION OF CPSS:

Among the priorities identified by the career education movement of the seventies were 1) a need to blend student career development into the mainstream of educational practice, and 2) a need to meet increased accountability demands in the delivery of instructional and counseling services in public schools. To meet these two needs recent research activities have emphasized the importance of systems methodology in properly planning, implementing, and evaluating career development programs (Campbell, 1975; Campbell et al., 1971; Hosford and Ryan, 1970).

Mitchell and Gysbers (1979) reported that an emerging direction for career development and guidance in schools is the guidance system comprised of a series of interrelated planning, design, implementation, and evaluation components. Herr (1979) recommended that guidance at the local school level be based on student needs and planned as a total program with goals, objectives, activities, and student outcomes. A National Vocational Guidance Association Position Paper on Criteria for Career Guidance Programs (1979) stated, "in order to achieve lasting effectiveness, it is important that (career development) program planners follow a comprehensive student needs-based and evaluation-oriented approach to program development."

In response to the need for systematic program planning for student career development programs, the National Center for Research in Vocational Education developed and tested CPSS from 1971 to 1973. A two-year (1974-76) field test of CPSS resulted in important revisions of the materials. Thirty-eight individual high schools, ranging from rural schools of less than 100 to large urban and suburban schools of more than 2,000 students, participated in the field testing. This submission is based on a 1978-79 assessment of CPSS which involved eighteen high schools in seven states. The purpose of the assessment study was to test the effectiveness of the CPSS materials as a high school career development program support system.

CPSS consists of handbooks, reproducible forms and filmstrips that describe a comprehensive organizational framework and procedural steps a school staff can use to create an accountable, school-wide high school career development program. The following list describes the complete set of CPSS materials:

- The Coordinator's Training Guide is a self-instructional training guide for the part-time CPSS coordinator.
- The Coordinator's Handbook contains instructions that describe step-by-step procedures for managing and implementing CPSS in the high school.
- Camera-Ready Forms are reproducible copies of each form needed for the questionnaires, instructions, CPSS Program Information File, etc.
- Handbooks

  The Advisory Committee Handbook defines the responsibilities and duties of Advisory Committee members (five copies).

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Assessing Resources guides a resource leader in directing a task force to collect information on and account for the use of resources in the school and community.

Assessing Needs: Surveying provides instruction for preparing, administering, and collecting survey questionnaires for students, graduates, parents, and faculty/staff (five copies).

Assessing Needs: Tabulation contains instruction on manually tabulating data collected by questionnaires (five copies).

Analyzing Methods directs a methods specialist about the availability and application of guidance methods and how to integrate this knowledge during the construction and review of career development units.

The Manual for Writing Behavioral Objectives is a self-instructional resource for a behavioral objectives specialist.

Writing Behavioral Objectives informs the behavioral objectives specialist about the function of behavioral objectives in the construction of career development units.

Producing Career Development Units (CDUs) provides direction for developing career guidance/development activities.

- Filmstrip/Audio Tape Presentations include:

AV-1: "An Orientation to CPSS"--orients interested persons to CPSS.

AV-2: "Shaping Program Goals"--gives an overview of how the needs and resources assessments lead to goals for a school.

AV-3: "Behavioral Objectives"--accompanies the behavioral objectives manual.

AV-4: "Producing CDUs"--gives an overview of the career development unit process.

Claims of effectiveness. CPSS is intended as a set of tools to assist with institutional changes in planning for career development programs in high schools. It is assumed that the school staff using CPSS is motivated to plan for the school's career development program. The main claim of this submission is stated below.

> Use of the CPSS materials for one academic year enables a high school staff to implement a systematic planning process for student career development programs. Within the one-year time interval, the planning process will produce student career development activities and a career development program of higher quality than activities and programs that arise naturally in schools not using CPSS.

It is important to note that this claim refers to institutional changes in planning process and related activities. It currently is not feasible to demonstrate effects on student career-development outcomes. Theory and professional judgment, however, strongly suggest that students benefit from well-planned career-development programs.

For the purposes of this submission "systematic planning process" includes the following elements:

- Establishment of an organizational structure facilitating a career development program, to include clearly designated leadership and permanent active committees and work groups.

- Assessment of the career development needs of local students and use of the results of the needs assessment in the career development program.

- Creation of explicit career development goals reflecting assessed student career development needs, listed in order of importance.

- Creation of student behavioral objectives designed to implement the goals.

- Creation of student activities to achieve the objectives and goals.

Career development in the CPSS perspective is defined as the process by which an individual student acquires the basic, nontechnical skills needed for functioning in the world of work. A career development program is a sequence of activities designed to help foster student career development. Student career development activities are activites in which students participate to improve their career development skills. The quality of the school programs and student activities are defined by judgments rendered by a panel of expert judges.

Intended users of CPSS. High school personnel and students cooperate in use of CPSS.

Costs to schools. Table 1 shows cost estimates for using CPSS during the first year and subsequent years. The figures could be converted to costs per learner by dividing by the number of student users, but this ratio does not seem like a useful statistic since CPSS is designed to affect directly the institution, and the main claim of this submission refers to institutional change, not learner change. Because costs may vary among schools, ranges are entered in the table.

TABLE 1. COST ESTIMATES PER SCHOOL

	First year (Nonrecurring Costs)	Subsequent Years (Recurring Costs)
Personnel	2900--7250	2175--2900
Staff Training	0	0
Special Facilities	0	0
Equipment	0	0
Consumables	123	61
Other Costs	260	60
TOTAL COSTS	3283--7633	2296--3021

VI. EVIDENCE OF EFFECTIVENESS

Design of the field test. Data supporting the claim for effectiveness were gathered, using a pre-post, experimental-control group design, on 18 high schools. The high schools were located in Arizona, Maryland, Illinois, Kentucky, Tennessee, Florida, and Colorado. Table 2 displays descriptive statistics for the test sites. Ten of the 18 participating schools used CPSS for one academic year, and the remaining eight did not. In this document CPSS users frequently are referenced as experimental schools and nonusers are termed control schools. Measurements on all variables related to the main claim were taken before and after the school year in which experimental schools used CPSS.

TABLE 2. CHARACTERISTICS OF TEST SITES

Average of Characteristics	Control Schools	Experimental Schools	t-value
Size of student population	1916	1943	.074
Ratio of faculty & staff to student pop.	19.49	17.64	1.540
ACT/SAT scores*	15.67	16.84	.748
Estimates of family income	$12000	$13125	.607
Drop-out rate	7.4%	10.0%	1.375
Percent white	38%	51%	.814

NOTE: Table entries are averages over the control or experimental schools, as labeled. Experimental school refers to a school that used CPSS during the study, and control school refers to a school that did not use CPSS.

*Five schools made SAT scores available, and the remaining 13 submitted ACT averages. The five SAT scores were converted to the metric of ACT by dividing them by the ratio of the average over schools SAT to the average ACT.

Each school provided a part-time coordinator who was responsible for the preparation and completion of data collection forms and who served as the contact person with the National Center staff. In the experimental schools this contact person also served as the CPSS coordinator. The experimental school coordinators received a three day training in CPSS procedures in November 1978. The training was conducted at the National Center by project staff. Training normally is not necessary for use of CPSS; it was provided in this instance to help accelerate the normal process of creating a career planning system, in order to complete the study within the specified time period.

Both experimental and control schools were monitored by monthly telephone calls and one site visit in February, 1979. This was in addition to pretest and posttest site visits to all schools in November or December of 1978 and May or June of 1979. The telephone calls and site visits included very little technical assistance. Experimental school coordinators were requested to complete project logs twice a month, describing the progress of CPSS in the school.

Participating schools volunteered in response to a national publicity campaign. The original intent was to assign participating schools at random to experimental and control conditions, but due to insistence of local school administrators random assignment occurred in only four instances. In the remaining cases, local school officials made the determination. Experimental schools were paid 5000 dollars to defray expenses, mostly to pay for personnel time. Control schools were paid 500 dollars and given a set of CPSS materials at the end of the study.

Self selection of schools into the study at first appears to threaten the external validity of the results, but, on reflection, probably poses no such threat. All users of CPSS certainly will be self-selected; therefore, the sample is drawn from the universe of probable users. Inability to control assignment of schools to experimental and control conditions poses some threat to the internal validity of the design. The pre-post nature of the design, equivalence of the experimental and control schools on key variables (see Table 2), and the magnitude of the gains for experimental schools suggest that the results likely are not due solely to the nonrandom assignment, however. The main threat to the internal validity of the study is the interaction between those selected into the experimental group and "maturation" (i.e., changes that would occur without the treatment, but only in experimental schools) (Campbell and Stanley, 1966). While interaction between "maturation" and selection cannot be entirely ruled out as a contributing factor in experimental school

gains, the gains reported below are too large reasonably to be attributed solely to the interaction of maturation and the treatment variable. These gains are all over one standard deviation.

Measurement. Two data collection forms, the Career Development Program Status Report and the Verification Checklist, and one rating instrument, the Career Development Program Rating Instrument, were developed and used for the study. The Status Report and Verification Checklist were used to collect information from the field sites. The information was then reviewed and rated by a fifteen member review panel with acknowledged expertise in career development. The review panel members individually answered questions on the Rating Instrument by referring to information collected on the Status Report and Verification Checklist for each school. All analyses reported in this submission were based on data drawn from the Rating Instrument.

The Career Development Program Status Report and the Verification Checklist were developed by project staff. A review of the forms by external consultants indicated that the forms provide information related to the quality of a systematic career development program and have content validity.

The Status Report was completed by school personnel in all schools who documented the extent to which their existing career development program planning reflected the basic components of systematic career development program planning. These data were collected before experimental school coordinators were trained. The completed Status Report was reviewed on-site by project staff and missing data were obtained. Examples of the type of information collected through the Status Report include data about career-education goals, assessment and evaluation related to career education, and student career-development activities. Career development activities include, but are not limited to, curriculum units, visits to local businesses, and career days.

The Verification Checklist provided a means by which project staff could corroborate, clarify, and expand the information recorded on a school's Career Development Program Status Report. During the pretest and posttest site visits, a National Center staff member completed the checklist with the assistance of school personnel, and both persons signed the completed form indicating agreement on the accuracy of the information. Examples of information gathered on the Verification Checklist include data about career-education needs, career-education goals, committee organization related to the career education of students, and quality of student career development activities.

The Rating Instrument was developed by project staff with the assistance of an external instrument design specialist. Two factors basic to the design of the rating instrument were: (1) inclusion of items that were clearly answerable given the descriptive information that was being rated, and (2) the exclusion of items that did not allow control schools a fair opportunity to receive a high rating.

The Rating Instrument is divided conceptually into two major parts. Part One asks questions concerning specific facts describing the school's career development program. Detailed questions are asked about the conduct of needs assessment, goal formation, objective writing, student activities, and organizational structure. Part two contains six summary questions asking raters to form broad judgments, based on their ratings in part one, and on information provided in the Career Development Program Status Report and the Verification Checklist.

A group of fifteen eminent persons in fields related to career development research and practice was assembled at the National Center to assist with interpretation of the information collected from the field sites. Panelists completed

two twenty-one page rating instruments for each participating high school. The first completion provided a description of all schools at the beginning of the school year, 1978-79, and the second completion described the career development program in all schools at the end of the school year. During the year the experimental schools used CPSS materials and the control schools did not. It should be noted that all identifying information, e.g., state, city, school, name, address, and dates had been removed from the data sources prior to the ratings.

At least three panelists were assigned at random to rate each experimental and control school. Assigning more than one rater to each school permits numerical assessment of reliability of the ratings and yields more accurate results than could be obtained from a single rating per school. Pretest and posttest ratings for each school were done by the same group of panelists. Panelists were given no information about the nature of the design prior to the rating session. In particular, experimental and control schools and the pre-post feature of the design were not identified to panelists. In a final debriefing session, after all rating activities had been completed, the panelists were told that they had participated in an assessment study of the Career Planning Support System. They were given copies of CPSS materials, a study abstract, and informed of all aspects of the study. The panelists indicated that they had neither surmised the nature of the study nor recognized that they had rated pre and posttest data from the same schools.

The main reason for use of a panel of judges is related to the nature of the subject matter. Few people would doubt that efficient organization and planning comprise important aspects of high school career development programs. Yet the important features of efficient organization and planning remain uncodified in sufficient detail to permit completely objective measurement. In such instances, human judgments are essential. Hence, a panel of individuals was assembled with the experience, training, and reputation to provide the most accurate judgments available.

Because of their importance to the presentation, the six questions addressed by the panelists are reproduced verbatim below.

1. Estimate the extent to which the school staff was organized to plan systematically a comprehensive career development program by evidence of clearly designated leadership; administrative cooperation; and permanent, active groups and committees.

2. Estimate the extent to which a student career development needs assessment was conducted, tabulated, properly interpreted, and the data utilized for planning the career development program.

3. Estimate the extent to which a comprehensive set of ordered career development goals reflecting assessed student career development needs were developed and used in planning, implementation and evaluation of the program.

4. Estimate the extent to which a set of behavioral objectives was developed reflecting specific goals and containing a clear statement of the intended audience, behavior, situation and standard of mastery.

5. Estimate the extent to which career development activities were developed that reflect student needs, goals, and associated objectives, and that indicate methods, target student group and outcome measures by referring to the two attached career development activities.

6. Based on the available information (including all career development activities), rate the overall quality of the school's career development program.

The first four questions are designed to indicate the degree to which schools had a systematic planning process. Question five measures the extent to which the school had high-quality career development activities for students. The last question indicates the quality of the career development program in the school. Thus, each element in the claim is reflected in these questions. To answer these questions, raters referred to all information on the Status Report and Verification Checklist from each school. Thus, raters had at their disposal data regarding schools' student career development needs and goals, career development activities designed for use with students, and organization of career-development program planning. Ratings for the first five of these items were recorded on a five point scale ranging from "limited extent" (scored 0) to "great extent" (scored 4). Ratings on the overall quality were also recorded on a five point scale ranging from zero to four, but the two extreme points were labeled "very low quality" and "very high quality."

The unit of analysis for all statistical results is the school. A score describing each school on each variable was calculated by forming the average over the three or four raters who rated each school. Agreement among raters for a given school, thus, indicates the reliability of the scores, and, conversely, disagreement among raters indicates unreliability. The discrepancies among raters of a given school can be compared to differences in average ratings across schools. This idea forms the conceptual basis for calculating reliability coefficients based on an analysis of variance model (see Winer, 1971: 283ff). The idea is to compare a mean-square within schools to the mean-square between schools. Since the object of the design is to minimize pretest differences among schools, these calculations are based on posttest scores only. This procedure is quite analogous to calculation of reliability coefficients from student scores on a test following a curriculum unit, because a "floor" effect artificially deflates reliability calculations derived from pretest scores. The point is, that there is very little variance between schools on the pretest; all schools score low. The calculations omit consideration of "anchor points" (Winer, 1971: 289ff), thus yielding somewhat conservative estimates of reliability. The formula used approximates an unbiased estimate of reliability, assuming no anchor point differences among raters (unlike correlational methods such as split half or coefficient alpha, which are biased downward).

Reliability of these items is uniformly quite high. The numerical values range from .829 to .932, and average .881 (see Figure 1).

In addition to reliability coefficients based on agreement among different raters of the same schools, panelists were asked to estimate their confidence in each rating they made. The confidence rating was the same for each question. Raters were asked to place a check along a scale from zero to 100 indicating their judgments regarding the likelihood that their answers were accurate. The average confidence ratings of panelists is quite high, ranging from 87.0 to 91.9 percent, thus reinforcing the reliability calculations. In spite of the need for approximate judgments, therefore, it is concluded that available evidence is consistent with the view that the measurements are accurate to within tolerable limits.

Data analysis methods. The statistical method is analysis of covariance (ANCOVA). The dependent variables for the ANCOVA are posttest scores describing the planning process of each school at the end of the experiment. There are two independent variables including one categorical factor--experimental condition defined by the use or nonuse of CPSS--and one covariate defined as the pretest score corresponding to the posttest dependent variable. Conceptually, the ANCOVAs describe differences in posttest scores between schools using CPSS and schools not using CPSS, under statistical control for the pretest scores. Although it does not appear to be widely recognized, the ANCOVA model can be viewed as a model of change. Conceptually, the ANCOVA can be viewed as expressing the following hypothesis: Change over the

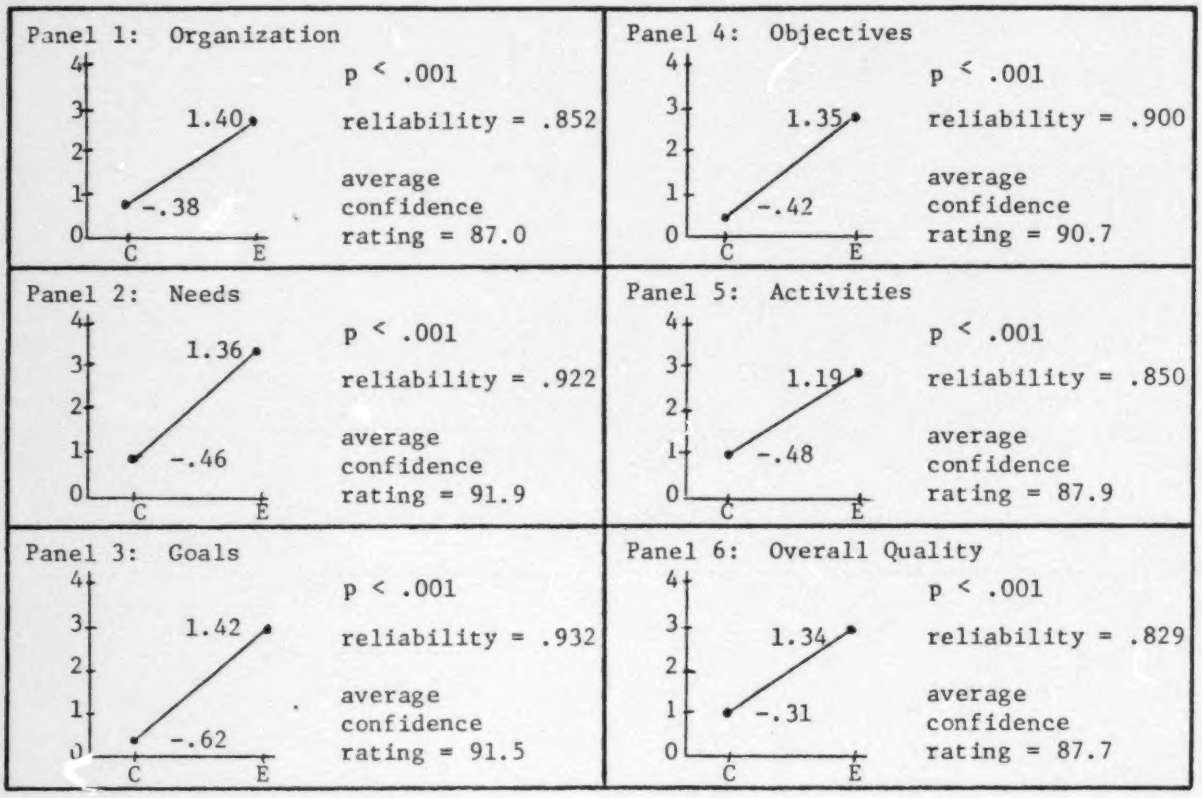

FIGURE 1. ANCOVAs, RELIABILITY, AND CONFIDENCE RATINGS FOR SIX SUMMARY MEASURES.

NOTE: The number beside each point on the graphs is the mean after data were transformed to standard scores (zero grand mean and unit variance overall).

period of the experiment is greater for schools using CPSS than for schools not using CPSS, when statistical controls for the effect of the starting point (pretest scores) are applied.

Results. The major results of the study are summarized in Figure 1. Each of the first four panels of the figure summarize the results for one element used to define a systematic career planning process. Panel five shows results for question five, reflecting the quality of the career development activities for students. The sixth panel summarizes judgments of the overall quality. The panels of the figure are numbered and labeled to correspond to the questions reproduced on page 6 of this submission.

The graphs display plots of mean differences in posttest scores between experimental schools (E) and control (C), as adjusted statistically by the analysis of covariance for pretest scores on the dependent variable. Alternatively, as noted above, these graphs may be interpreted as differences in change from pretest to posttest, adjusted for differences in starting point. The vertical axes represent scores on the six items. The lefthand point on the horizontal axes (labeled C) corresponds to the control group, and the righthand point corresponds to the experimental group (labeled E). All six graphs show a substantial positive slope, thereby lending support to the hypotheses. All statistical tests are highly significant, with probabilities less than .001. (Reported probabilities are for the main effect of the experimental variable, after adjustment for the covariate.)

Whenever random assignment to treatment groups cannot be realized, observed differences between treatment groups, in theory can be due to nontreatment variables. The standard methodology for handling objections of this sort is to introduce some type of statistical control for a small group of variables that are likely candidates to account for observed differences between treatment groups. In the present study the treatment variable is defined by the two categories--used CPSS and did not use CPSS. Averages on the following variables were compared statistically for users and nonusers of CPSS: student population size, ratio of faculty and staff to students, academic test scores, drop-out rate, percentage of the students who were minority group members, and a rough estimate of family income of the students. As shown in Table 2, in none of these five tests were statistically significant differences observed. Hence, it is concluded that the differences between users and nonusers of CPSS on the six criterion variables are not due to any of these five characteristics of schools.

Educational importance. There are two factors related to the educational importance of the results. First, are the gains of sufficient magnitude to be nontrivial? Seocndly, does CPSS address an important educational need?

To assess the magnitude of the gains, Figure 1 presents standard scores for each point on the graphs. The decimal number beside each point on the graphs is the adjusted mean given in standard score units. The calculations were carried out with the mean and standard deviation of each variable calculated over pretest and posttest and over experimental and control groups. One might prefer using the pretest means and standard deviations because these values more accurately reflect the general population of schools, the vast majority of which have not used CPSS. Reliance on the overall mean and standard deviation show the results in a conservative light, however, since the pretest standard deviation is, for every variable, considerably smaller than the overall standard deviation. Dividing by the smaller standard deviation would magnify differences between experimental and control schools.

The standard scores reveal that in every instance, after adjusting for pretest scores by analysis of covariance, the posttest experimental schools are over one standard deviation above the grand mean; whereas, posttest control schools are one-third to three-fifths standard deviations below the mean. Treatment effects of this magnitude are seldom observed in social research. It is concluded, therefore, that the magnitude of the standard scores indicates educationally important gains for the experimental schools.

The second aspect of educational significance is the need addressed by CPSS. As noted in the opening paragraphs of this submission, the CPSS materials were developed in response to a need for improved career development program planning in schools. This need has been expressed repeatedly in a variety of professional forums representing several professional specialties. Prior to development of CPSS, a consensus developed which reported that systematic planning was an essential ingredient in improving career development programs. The CPSS materials are designed to instruct school staffs in the use of a systematic planning process and development of associated products for building career development programs in high schools. The data in this submission demonstrate that the materials do enable staffs to create a systematic planning process.

REFERENCES

Campbell, R.E. "The Application of Systems Methodology to Career Development Programs." In Zalatino, S.D. and Sleeman, P.J., eds., A Systems Approach to Learning Environments. Roselle, New Jersey: Meded Projects, Inc., 1975.

Campbell, R.E., Dworken, E.P., Jackson, D.P., Hoeltzel, K.E., Parsons, G.E., and Lacey, D.W. The Systems Approach: An Emerging Behavioral Model for Career Guidance. Columbus, Ohio: The Center for Vocational and Technical Education, 1971.

Campbell, D.T., and Stanley, J.C. Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally & Co., 1966.

"Guidelines for a Quality Career Guidance Program." AVA Guidance Division Newsletter, 1979.

Herr, E.L. Guidance and Counseling in the Schools: The Past, Present, and Future. Falls Church, Virginia: The American Personnel and Guidance Association, 1979.

Hosford, R.E., and Ryan, A.T. "Systems Design in the Development of Counseling and Guidance Programs." Personnel and Guidance Journal, 49: 221-230, 1970.

Mitchell, A., and Gysbers, N., issue paper referenced in E.L. Herr, ed., Guidance and Counseling in the Schools: The Past, Present, and Future. Falls Church, Virginia: The American Personnel and Guidance Association, 1979.

Winer, B.J. Statistical Principles in Experimental Design. New York, New York: McGraw-Hill, Inc., 1971.